SIDE-POWER
Thruster Systems

SPS Winglet Replacement

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Norway
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Made in Norway

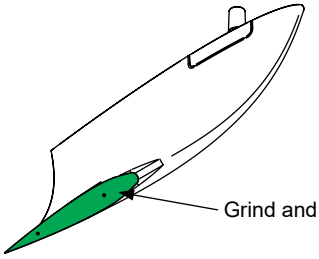
Instructions for how to glue the winglet to the vector fin:

Attached are product data sheets that outline the additional agents used in the below installation.

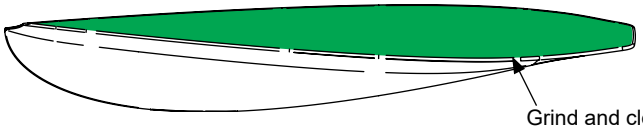
If the installer can not obtain these products consult an experienced dealer to find products that retain the characteristics of the defined product.

1. Grind and clean the fin surface where the winglet will sit and the wiglet connection surface with 16-60 grit dry abrasive paper.

   Immediately apply a layer of G4 primer on both winglet and fin surfaces. Allow to harden for 0.5 to 4 hours. (See attached datasheet - “Section for Application of G4 as a primer for epoxy and polyester resin (GRP)”)



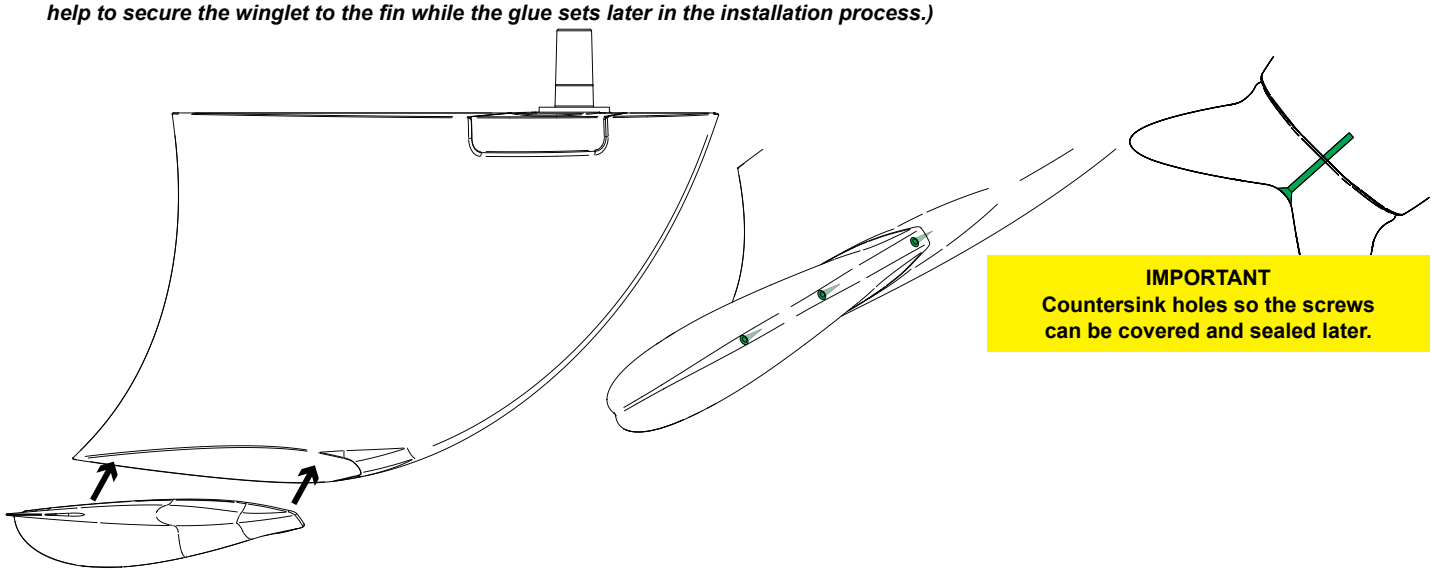
Grind and clean



Grind and clean

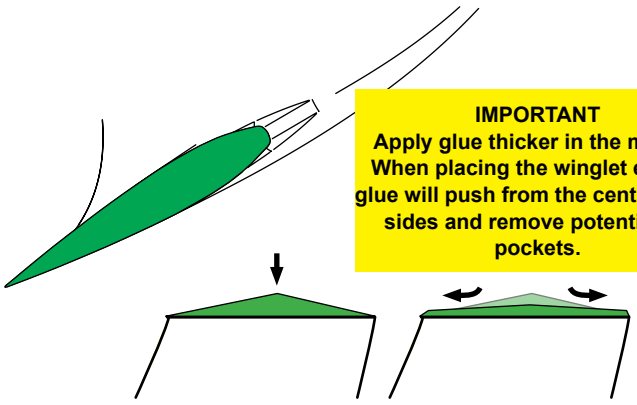
2. Proceed with a ‘dry’ installation of the winglet to the fin.

   Place the winglet to the fin. Drill screw holes and screw the winglet to the fin. ***(NB: depending on the size use 2 - 4 screws. This process is to help to secure the winglet to the fin while the glue sets later in the installation process.)***



IMPORTANT
Countersink holes so the screws can be covered and sealed later.

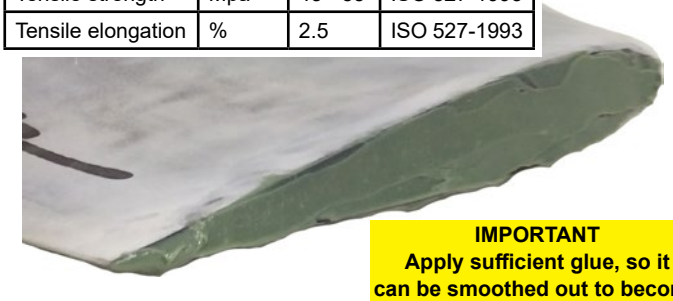
3. Remove the winglet. Apply a layer of the FI-184 glue to the correct surface of the fin. (See attached data sheet)



IMPORTANT
Apply glue thicker in the middle. When placing the winglet excess glue will push from the centre to the sides and remove potential air pockets.

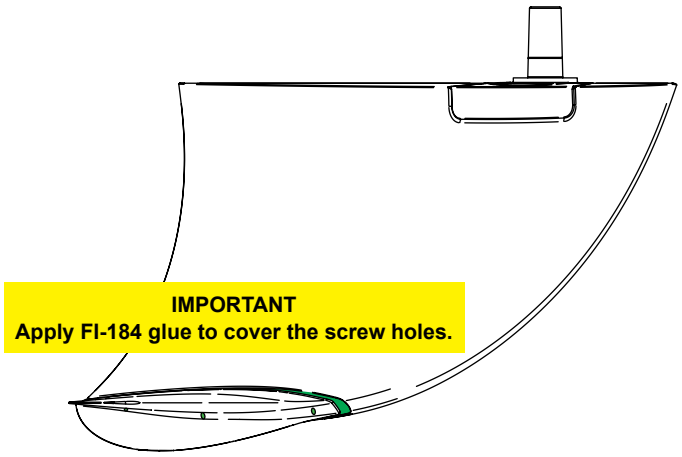
Typical NON-REINFORCED casting properties
Cured 24h at RT +24h at 50°C

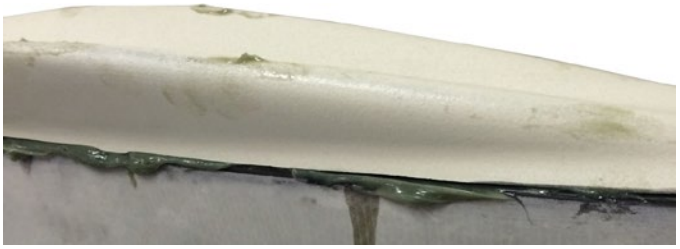
Properties	Unit	Value	Test Method
Tensile strength	Mpa	45 - 55	ISO 527-1993
Tensile elongation	%	2.5	ISO 527-1993



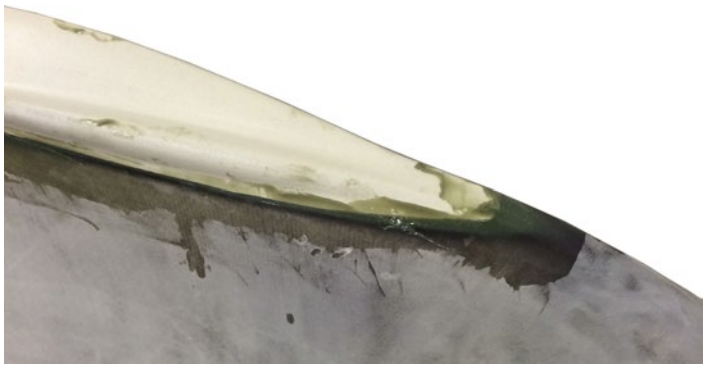
IMPORTANT
Apply sufficient glue, so it can be smoothed out to become a seamless surface.

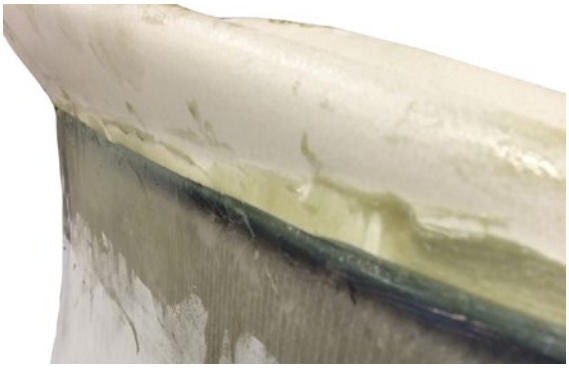
4. Place the winglet aligned with the fin surface. Lock and secure the winglet with previous screws to support the winglet and maintain pressure during curing time. ***(NB: Especially if the fin is sitting on the boat.)***





5. Smooth out the glue from the sides, holes and the front nose before its finished curing.

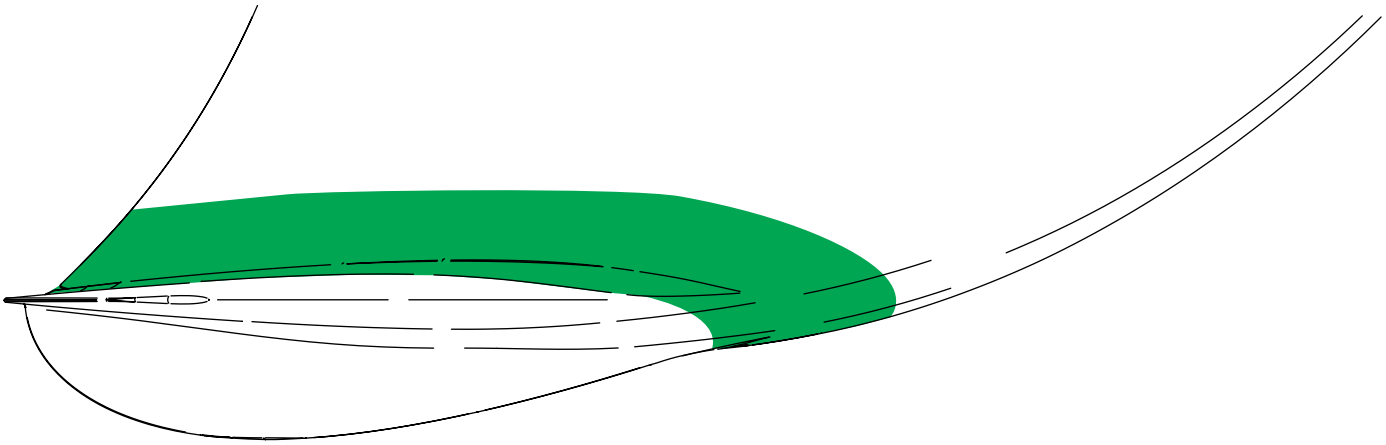




Allow the glue to set.

6. Grind and clean the surface of the transition between winglet and fin (16-60 grit dry abrasive paper).

   Apply 3 layers of epoxy primer Hempadur(45143 with Curing Agent 97430 or equivalent), wait aprox 30min between each layer. See attached datasheet. After curing time of the epoxy primer, apply 2 layers of antifouling.



Warranty statement

1.The equipment manufactured by Sleipner Motor AS (The "Warrantor") is warranted to be free from defects in workmanship and materials under normal use and service.
2.This Warranty is in effect for of two years (Leisure Use) or one year (Commercial use) from the date of purchase by the user. Proof of purchase must be included, to establish that it is inside the warranty period.
3.This Warranty is transferable and covers the product for the specified time period.
4.In case any part of the equipment proves to be defective, other than those parts excluded in paragraph 5 below, the owner should do the following:
(a) Prepare a detailed written statement of the nature and circumstances of the defect, to the best of the Owner's knowledge, including the date of purchase, the place of purchase, the name and address of the installer, and the Purchaser's name, address and telephone number;
(b) The Owner should return the defective part or unit along with the statement referenced in the preceding paragraph to the warrantor, Sleipner Motor AS or an authorized Service Centre, postage/shipping prepaid and at the expense of the Purchaser;
(c) If upon the Warrantor's or Authorized Service Centre's examination, the defect is determined to result from defective material or workmanship, the equipment will be repaired or replaced at the Warrantor's option without charge, and returned to the Purchaser at the Warrantor's expense;
(d) no refund of the purchase price will be granted to the Purchaser, unless the Warrantor is unable to remedy the defect after having a reasonable number of opportunities to do so. Prior to refund of the purchase price, Purchaser must submit a statement in writing from a professional boating equipment supplier that the installation instructions of the Installation and Operation Manual have been complied with and that the defect remains;
(e) warranty service shall be performed only by the Warrantor, or an authorized Service Centre, and any attempt to remedy the defect by anyone else shall render this warranty void.
5. There shall be no warranty for defects or damages caused by faulty installation or hook-up, abuse or misuse of the equipment including exposure to excessive heat, salt or fresh water spray, or water immersion except for equipment specifically designed as waterproof.
6. No other express warranty is hereby given and there are no warranties which extend beyond those described in section 4 above. This Warranty is expressly in lieu of any other expressed or implied warranties, including any implied warranty of merchantability, fitness for the ordinary purposes for which such goods are used, or fitness for a particular purpose, and any other obligations on the part of the Warrantor or its employees and representatives.
7. There shall be no responsibility or liability whatsoever on the part of the Warrantor or its employees and representatives for injury to any person or persons, or damage to property, loss of income or profit, or any other consequential or resulting damage or cost which may be claimed to have been incurred through the use or sale of the equipment, including any possible failure or malfunction of the equipment, or part thereof.
8. The Warrantor assumes no liability for incidental or consequential damages of any kind including damages arising from collision with other vessels or objects.
9. This warranty gives you specific legal rights, and you may also have other rights which vary from country to country.

Worldwide sales and service

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SLEIPNER MOTOR ✳ AS P.O. Box 519 ✳ N-1612 Fredrikstad ✳ Norway

MC_0030

VOSSCHEMIE

Technical Data Sheet

G 4 PRIMER

POLYURETHANE SEALER

01/06
June 2006

CHARACTERISTICS

G4 is a one component polyurethane resin that contains solvents. It has been specially developed for application on boats. It is applied in thin coatings, hardens by the release of solvents and cross links with the moisture in the air. It has a highly abrasion resistant gloss surface. G4 has a browny translucent colour and is not resistant to UV light, it will yellow over a period of time when exposed to sunlight. G4 has excellent adhesion to wood and metal provided the surface is grease and oil free, clean, porous and dry. Metal surfaces should be thoroughly sanded. G4 cannot be applied to bitumen or other coatings that are not solvent resistant. For total chemical resistance it should be allowed to harden for at least 7 days at 20°C and 75 % air humidity. It is chemically resistant to low concentrations of acids and alkalis and water at room temperature. G4 can be pigmented with the addition of max. 5 % of PU PIGMENT PASTE, however, this is only recommended for special applications. The addition of pigment will reduce the mechanical strength as well as the working time and it will increase the rate of yellowing.

AREA OF APPLICATION

Applied as a sealer for wood G4 is a very tough coating for hard woods (e.g. mahagony). It will have a yellowing effect on light woods.
G4 can be applied to wood and metal surfaces as an adhesion primer for epoxy and polyester (GRP) coatings.
G4 can be used as a binder for wood flour for repairing splits and holes in wood.
G4 is not suitable for inside areas (e.g. cabins).

PRODUCT DATA

MATERIAL DATA	Packaging	0.5 l and 1.0 l container
	Colour	brownish transparent
	Specific gravity	0,98 g/cm³
	Flashpoint	26 °C
	Solids content	50 %
	NCO content	ca. 6%
	Viscosity at 20°C	ca. 100 m Pa.s
	Theoretical consumption	100 ml/m² on non absorbent surfaces 200-250 ml/m² on absorbent surfaces

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VOSSCHEMIE

INSTRUCTIONS FOR USE

General working instructions

G4 is applied with a brush, roller or spray gun (when spraying a fresh air breathing mask must be used). The consumption should not exceed 250 ml/m² on absorbent surfaces and 100 ml/m² on non absorbent surfaces so as to ensure the coating hardens and to prevent entrapment of the solvent in the surface. During the application do not allow the coating to pool on the surface. On dense or slightly porous surfaces it is recommended that a primer coat is applied first, the G4 should be thinned using polyurethane thinners. The last two coats should always be applied without thinners.
G4 should always be applied in well ventilated areas and above 5°C.

Application of G4 as a wood/sealing coating

G4, with its slightly brownish colour, is a very tough coating for hard woods, e.g. mahagony. It will have a yellowing effect on light woods.
Old paints must be thoroughly grounded off. The penetration and flow properties will be improved by the addition of max. 200 % polyurethane thinners for the first coat and max. 100 % with second coat. At least two coats should be applied without thinner. Allow to harden for min. 6 hours before applying subsequent clear coats e.g. to improve the UV light resistance.

Application of G4 as a primer for epoxy and polyester resin (GRP)

G4 is used as a primer for improving the adhesion of polyester resins to metal, wood and concrete. This applies for both wood and metal hulled boats.
Wood and metal surfaces must be sanded with 80-120 grit dry abrasive paper. When used as a primer only one coat is applied straight from the tin. Allow to harden for 0.5 to 4 hours. Then apply the polyester resin and glassfibre. It is necessary to apply within this period.

Application of G4 as a binder for repairing damaged wood

G4 can be used to fill splits and holes in wood. Remove any loose pieces of wood from the area of the split and clean the surface. Prime the area with a thick coat of G4. Then make up a mixture of G4 and sawdust and fill the split. Even when the same colour sawdust is used it is impossible to match the colour of the wood. The hardening time depends on the depth of fill and the moisture in the wood. If the depth is over 1 cm it is advised that it is filled in two stages allowing the first to harden overnight. The surface will harden more rapidly than the inside.

APPLICATION DATA

The time between coats of G4 depends on the porosity of the surface, the temperature, ventilation and humidity. G4 hardens by the release of solvents and then by its reaction with the moisture in the air. In winter the material may take longer to harden if the temperature is near freezing point and the air very dry. When this happens the waiting time between the coats is longer because the tack free time is extended. Before applying the next coat the previous coat must be only slightly tacky. When used as a primer for GRP laminates, the G4 can be applied between 0.5 and a max. of 4 hours. If a two component coating is being applied the solvent must be allowed to almost evaporate, a minimum of 6 hours.

The time between applications of G4 is approx. 2-4 hours or as soon as the surface is tack free. Max. time between coats is 12 hours.

Hardened G4 can only be removed by sanding due to its hard surface.

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VOSSCHEMIE

SAFETY

The before mentioned technical data and information, especially the recommendations for applying and using our products, are based on our current knowledge and experience when applied under normal conditions. In practice, the materials, surfaces or site conditions are so different that no warranty regarding the working results or liability, arising out of any relationship, can be inferred neither from this information nor from a verbal consultation, except we are charged with intent or gross negligence. In this case the user is obliged to prove that he has informed us about all points required for a proper and promising judgement in writing, in time and completely. Patent rights of any third party are to be observed. Furthermore, our general sales and delivery Terms and Conditions and the latest Technical Data Sheet, which should be demanded, apply.

Directions for handling and waste disposal are in our Security Safety Data Sheet and the specifications of the Employers Liability Insurance Association for the chemical industry.

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REICHHOLD

PRODUCT BULLETIN

January 2007

NORPOL FI-184-70

DESCRIPTION

NORPOL FI-184-70 is a vinyl ester based bonding paste for bonding polyester laminates giving grooves with great strength and toughness. Thicknesses up to 10 mm are recommended and to grind the surface to obtain optimum adhesion is advised.

NORPOL FI-184-70 is preaccelerated and is changing colour from light grey to yellowish/brown <5min. after the admixing of peroxide.
NORPOL FI-184-70 is suitable for machine application. We recommend to run tests with the machine before starting the bonding job to ensure proper admixing of the peroxide.

The bonding paste should be stored at 18-25 ºC .If the product have a temperature <18 ºC (which is no problem as to product quality) it should be heated to 18-25 ºC before use. See storage and handling document of NORPOL products.

TYPICAL PROPERTIES

PHYSICAL DATA IN LIQUID STATE AT 23°C

Properties	Unit	Value	Test method
Viscosity - Cone & Plate - Brookfield HBT sp. TB/5 rpm	 mPa·s(cP) mPa·s(cP)	 700-1000 100000-120000	 ISO 2884-1999 ASTM D 2196-86
Density	g/cm³	1.14	ISO 2811-2001
Gel time: 2 % NORPOL PEROXIDE 24	minutes	25-35	G020
Exotherm peak: 2% NORPOL PEROXIDE 24	min.	70-120	*
Storage stability from date of production	months	4	G180

* Exotherm peak measured in isolated groove 10 x 20 x 150 mm

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Reichhold, P.O.Box 2061, N-3202 Sandefjord, Norway, Tel. +47 33 44 86 00, Fax + 47 33 44 86 01

REICHHOLD [PRODUCT BULLETIN]

TYPICAL NON-REINFORCED CASTING PROPERTIES
Fully cured

Properties	Unit	Value	Test method
Tensile strength	MPa	35-40	ISO 527-1993
Tensile elongation	%	2.5-3.5	ISO 527-1993
Tensile modulus	MPa	3000	ISO 527-1993
Heat distortion temp.	°C	70	ISO 75-1993
Linear shrinkage	%	1.8	ASTM D 2566-69
Hardness Barcol , 934-1, min.		35-40	ASTM D 2583-99

STORAGE

To ensure maximum stability and maintain optimum resin properties, resins should be stored in closed containers at temperatures below 24°C/75°F and away from heat ignition sources and sunlight. Resin should be warmed to at least 18°C/65°F prior to use in order to assure proper curing and handling. All storage areas and containers should conform to local fire and building codes. Copper or copper containing alloys should be avoided as containers. Store separate from oxidizing materials, peroxides and metal salts. Keep containers closed when not in use. Inventory levels should be kept to a reasonable minimum with first-in, first-out stock rotation.

Additional information on handling and storing unsaturated polyesters is available in Reichhold's application bulletin "Bulk Storage and Handling of Unsaturated Polyester Resins." For information on other Reichhold resins or initiators, contact your sales representative or authorized Reichhold distributor.

SAFETY

READ AND UNDERSTAND THE MATERIAL SAFETY DATA SHEET BEFORE WORKING WITH THIS PRODUCT

Obtain a copy of the material safety data sheet on this product prior to use. Material safety data sheets are available from your Reichhold sales representative. Such information should be requested from suppliers of all products and understood prior to working with their materials.

DIRECTLY MIXING ANY ORGANIC PEROXIDE WITH A METAL SOAP, AMINE, OR OTHER POLYMERIZATION ACCELERATOR OR PROMOTER WILL RESULT IN VIOLENT DECOMPOSITION

Product Data

HEMPADUR 45143

Cold climate application: 45143: BASE 45148: CURING AGENT 97430

Description:
HEMPADUR 45143 is a two-component, polyamide adduct cured epoxy paint with good wetting properties and low water permeability. It is selfpriming and forms a hard and tough coating which has good resistance against abrasion and impact as well as to seawater, mineral oils, aliphatic hydrocarbons and splashes from petrol and related products. Harmless to grain cargoes.

Recommended use:
1. As a high build primer, intermediate and/or finishing coat in (heavy duty) paint systems according to specification. (As a finishing coat where a cosmetic appearance is of less importance).
2. For repair and maintenance work at application temperatures above -10°C/15°F on hatch covers, decks, in cargo holds and ballast tanks etc.
HEMPADUR 45143 is intended for use in cold/temperate climates, HEMPADUR 45141 for warmer climates - see APPLICATION CONDITIONS overleaf.

Service temperature:
Maximum, dry exposure only: 150°C/302°F
Immersion service. Resists normal ambient temperatures at sea (Avoid long-term exposure to negative temperature gradients).

Certificates/Approvals:
Complies with Section 175.300 of the Code of Federal Regulations Title 21 – Dry Foodstuff. Consult Hempel for details.

Tested for non-contamination of grain cargo at the Newcastle Occupational Health & Hygiene, Great Britain.
Approved as a low flame spread material when used as part of a predefined paint system. Please refer to “Declaration of Conformity” on www.Hempel.com for further details.
Complies with EU Directive 2004/42/EC: subcategory j.

Availability:
Part of Group Assortment. Local availability subject to confirmation.

PHYSICAL CONSTANTS:

Shade nos/Colours:	50630*/ Red
Finish:	Semi-gloss
Volume solids, %:	60 ± 1
Theoretical spreading rate:	4 m^2/l [160.4 sq.ft./US gallon] - 150 micron/6 mils
Flash point:	25 °C [77 °F]
Specific gravity:	1.3 kg/litre [10.6 lbs/US gallon]
Surface dry:	5 (approx.) hour(s) 5°C/41°F
Dry to touch:	11 (approx.) hour(s) 5°C/41°F
Fully cured:	20 day(s) 5°C/41°F
VOC content:	367 g/l [3 lbs/US gallon]

**other shades according to assortment list.*

The physical constants stated are nominal data according to the HEMPEL Group's approved formulas.

APPLICATION DETAILS:

Version, mixed product:	**45143**
Mixing ratio:	BASE 45148: CURING AGENT 97430 3:1 by volume
Application method:	Airless spray / Brush
Thinner (max.vol.):	08450 (5%) / 08450 (5%)
Pot life (Airless spray):	2 hour(s) 15°C/59°F
Pot life (Brush):	4 hour(s) 15°C/59°F
Nozzle orifice:	0.019 - 0.023 "
Nozzle pressure:	250 bar [3625 psi] (Airless spray data are indicative and subject to adjustment)
Cleaning of tools:	HEMPEL'S TOOL CLEANER 99610 or HEMPEL'S THINNER 08450
Indicated film thickness, dry:	150 micron [6 mils] see REMARKS overleaf
Indicated film thickness, wet:	250 micron [10 mils]
Overcoat interval, min:	see REMARKS overleaf
Overcoat interval, max:	see REMARKS overleaf

Safety:
Handle with care. Before and during use, observe all safety labels on packaging and paint containers, consult HEMPEL Safety Data Sheets and follow all local or national safety regulations.

HEMPADUR 45143

SURFACE PREPARATION:

New steel and similar areas: Remove oil and grease etc. thoroughly with suitable detergent. Remove salts and other contaminants by high pressure fresh water cleaning. Abrasive blasting to minimum Sa 2½ (ISO 8501-1:2007) with a surface profile equivalent to Rugotest No. 3, min. N9a, Keane-Tator Comparator (G), 2 mils segments or ISO Comparator Medium (G). For temporary protection, if required, use a suitable shopprimer. All damage of shopprimer and contamination from storage and fabrication should be thoroughly cleaned prior to final painting. For repair and touch-up use: HEMPADUR 45143.
Repair and maintenance: Remove oil and grease, etc. with suitable detergent. Remove salt and other contaminants by (high pressure) fresh water cleaning. Clean damaged areas thoroughly by power tool cleaning to minimum St 3 (ISO 8501-1:2007) (spot-repairs) or by abrasive blasting to min. Sa 2, preferably to Sa 2½ (ISO 8501-1:2007). Improved surface preparation will improve the performance. As an alternative to dry cleaning, water jetting to min. Wa 2½ (ISO 8501-4:2006)(or according to specification), may be used. A flash-rust degree of maximum M (ISO 8501-4:2006) is acceptable before application. Feather edges to sound and intact paint. Dust off residues.
On pit-corroded surfaces, excessive amounts of salt residues may call for water jetting, wet abrasive blasting, alternatively dry abrasive blasting, high pressure fresh water hosing, drying, and finally, dry abrasive blasting again.

APPLICATION CONDITIONS:

HEMPADUR 45143 is intended for curing conditions down to -10°C/14°F.Apply only on a dry and clean surface with a temperature above the dew point to avoid condensation. In confined spaces provide adequate ventilation during application and drying.

PRECEDING COAT:

None, or as per specification.

SUBSEQUENT COAT:

None, or as per specification.

REMARKS:

VOC - EU Directive 2004/42/EC:

Product	As supplied	5 vol. % thinning	Limit phase II, 2010
4514350630	367 g/l	391 g/l	500 g/l

For VOC of other shades, please refer to Safety Data Sheet.

Colours/Colour stability:

Light shades will have a tendency to yellow when exposed to sunshine and darken when exposed to heat.

Weathering/service temperatures:

The natural tendency of epoxy coatings to chalk in outdoor exposure and to become more sensitive to mechanical damage and chemical exposure at elevated temperatures is also reflected in this product.

Induction time:

If the paint temperature, as an exception, is below approx. 10°C/50°F, allow the mixture to pre-react 30 minutes before use.

Film thicknesses/thinning:

May be specified in another film thickness than indicated depending on purpose and area of use. This will alter spreading rate and may influence drying time and overcoating interval. Normal range dry is: 125-175 micron/5-7 mils

Overcoating:

Overcoating intervals related to later conditions of exposure: If the maximum overcoating interval is exceeded, roughening of the surface is necessary to ensure intercoat adhesion.
Before overcoating after exposure in contaminated environment, clean the surface thoroughly with high pressure fresh water hosing and allow drying.

A specification supersedes any guideline overcoat intervals indicated in the table.

Environment	Atmospheric, medium					
Surface temperature:	-10°C (14°F)		0°C (32°F)		20°C (68°F)	
	Min	Max	Min	Max	Min	Max
HEMPADUR	36 h	Ext.	18 h	Ext.	4 h	Ext.
HEMPATEX	27 h	3 d	14 h	36 h	3 h	8 h
HEMPATHANE	36 h	90 d	18 h	45 d	4 h	10 d
Environment	Immersion					
HEMPADUR	54 h	90 d	27 h	90 d	6 h	30 d

NR = Not Recommended, Ext. = Extended, m = minute(s), h = hour(s), d = day(s)

Overcoating intervals:

Overcoating intervals related to later conditions of exposure: See separate APPLICATION INSTRUCTIONS
Before overcoating after exposure in contaminated environment, clean the surface thoroughly with high pressure fresh water hosing and allow drying. If the maximum overcoating interval is exceeded, roughening of the surface is necessary to ensure intercoat adhesion.

Note:

HEMPADUR 45143 For professional use only.

ISSUED BY:

HEMPEL A/S
4514350630

HEMPADUR 45143

This Product Data Sheet supersedes those previously issued.
For explanations, definitions and scope, see "Explanatory Notes" available on www.hempel.com. Data, specifications, directions and recommendations given in this data sheet represent only test results or experience obtained under controlled or specially defined circumstances. Their accuracy, completeness or appropriateness under the actual conditions of any intended use of the Products herein must be determined exclusively by the Buyer and/or User.
The Products are supplied and all technical assistance is given subject to HEMPEL's GENERAL CONDITIONS OF SALES, DELIVERY AND SERVICE, unless otherwise expressly agreed in writing. The Manufacturer and Seller disclaim, and Buyer and/or User waive all claims involving, any liability, including but not limited to negligence, except as expressed in said GENERAL CONDITIONS for all results, injury or direct or consequential losses or damages arising from the use of the Products as recommended above, on the overleaf or otherwise. Product data are subject to change without notice and become void five years from the date of issue.